I. AMENDMENTS TO THE CLAIMS

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1. (previously amended): A method of treating a human joint disease involving cartilage, which method comprises:

obtaining an electronic image of said joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information selected from the group consisting of volume, area, thickness, curvature, geometry, water content, sodium content, hyaluronic acid content, signal intensity or relaxation time of said normal or diseased tissue; and

selecting a therapy based on said information.

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2. (currently amended): The method of claim 1, wherein said electronically evaluating comprises a method selected from the group consisting of:

(1) a method of estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage so mapped at the initial time, obtaining a three-dimensional map of the cartilage at a later time, and calculating the thickness or regional volume of a region of degenerated cartilage so mapped at the later time, and determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times;

(2) a method for assessing the condition of cartilage in a joint of a human, which method comprises electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device; receiving the transferred image at the distant location; converting the transferred image to a degeneration pattern of the cartilage; and transmitting the degeneration pattern to a site for analysis;

(3) a method for determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises determining the thickness, D_N, of the normal cartilage near the cartilage defect; obtaining the thickness of the cartilage defect, D_D, of the region;

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L; and multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss;

(4) a method of estimating the change of cartilage in a joint of a mammal over time, which method comprises estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1; estimating the thickness or width or area or volume of the region of cartilage at a later time T_2; and determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times;

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(5) a method for providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises measuring a detectable biochemical component throughout the cartilage; determining the relative amounts of the biochemical component throughout the cartilage; mapping the amounts of the biochemical component in three dimensions through the cartilage; and determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present;

(6) a method of estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises defining a 3D object coordinate system of the joint at an initial time, T_1; identifying a region of a cartilage defect within the 3D object coordinate system; defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage; defining the 3D object coordinate system of the joint at a second timepoint, T_2; placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1; and measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2; and

(7) a method for correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises (a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint; (b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a); (c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b); and (d) using the skin reference markers to

correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

3. (original): The method of claim 1, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

4. (original): The method of claim 1, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

5. (original): The method of claim 1, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

6. (original): The method of claim 1, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

7. (original): The method of claim 1, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

8. (original): The method of claim 7, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

9. (original): The method of claim 8, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

10. (previously amended): A method of treating cartilage degeneration in a joint, which method comprises:

obtaining an electronic image of said joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information selected from the group consisting of volume, area, thickness, geometry, water content, sodium content, hyaluronic acid or relaxation time of said normal or diseased tissue; and

selecting a therapy to treat or replace said degenerated cartilage, wherein said information is used during selection of treatment or replacement therapy of said degenerated cartilage.

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11. (original): The method of claim 10, wherein said information includes thickness, shape, curvature, or location and dimensions of said normal or degenerated cartilage.

12. (original): The method of claim 10, wherein said technique to treat or replace said degenerated cartilage is autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, or femoral or tibial osteotomy.

13. (original): The method of claim 10, wherein said treatment or replacement therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

14. (original): The method of claim 10, wherein said information is used to determine the thickness, shape, curvature, or location and dimensions of a cartilage transplant, a cartilage graft, a cartilage implant, a cartilage replacement material, a scaffold for cartilage cell or acellular cartilage components or a cartilage regenerating material or a cartilage repair system.

15. (original): The method of claim 10, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

16. (original): The method of claim 10, wherein said information is used to generate a three dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

17. (original): The method of claim 16, wherein said physical model is used to shape a cartilage transplant, a cartilage graft, a cartilage implant, a cartilage replacement material, a scaffold or a cartilage regenerating material or a cartilage repair system.

18. (original): The method of claim 16, wherein physical model comprises an area of diseased cartilage as well as adjacent normal tissue.

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19. (original): The method of claim 18, wherein said adjacent normal tissue is bone, bone marrow, or normal cartilage.

20. (original): The method of claim 16, wherein said physical model is created with use of a 3D Euclidian distance transformation.

21. (original): The method of claim 16, wherein said physical model or a portion of said physical model is implanted into a knee joint.

22. (original): The method of claim 16, wherein said physical model carries cartilage cells or cartilage matrix.

23. (original): A method of treating a human with diseased cartilage in a joint, which method comprises:

utilizing an MRI scan to generate a cross-sectional electronic image of said joint, wherein said image includes both normal and diseased cartilage; and

utilizing information from said image to create a geometric model of an area of diseased cartilage, wherein said geometric model is used in selecting a treatment of said diseased cartilage.

24. (original): The method of claim 23, wherein said area of diseased cartilage includes adjacent normal tissue.

25. (original): The method of claim 23, wherein said geometric model is used to determine the shape of a cartilage transplant, a cartilage graft, a cartilage implant, a cartilage replacement material, a scaffold for cartilage cells or acellular cartilage components or a cartilage regenerating material or a cartilage repair system.

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26. (currently amended): A method of assessing cartilage disease in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises:

(a) obtaining a three-dimensional map of the cartilage demonstrating the thickness or biochemical contents or relaxation time of normal and diseased cartilage; and

(b) determining the margins of the diseased cartilage in relationship to the normal cartilage in said three-dimensional map.

27. (original): The method of claim 26, wherein said determination of said margins of said diseased cartilage is performed by detecting a difference in said thickness, said biochemical contents or said relaxation time between said normal and said diseased cartilage.

28. (original): The method of claim 26, wherein said determination of said margins of said diseased cartilage is used to determine the area, volume, or thickness of diseased cartilage.

29. (original): The method of claim 26, wherein said determination of said margins of said diseased cartilage is used to determine the percentage of total cartilage surface area in a joint or along an

articular surface represented by diseased cartilage or the percentage of weight-bearing surface area in a joint represented by diseased cartilage.

30. (original): The method of claim 26, wherein steps (a) through (b) are carried out at an initial time (T_1) and are carried out again at a later time (T_2).

31. (original): The method of claim 30, wherein the estimation includes an analysis of the degree of degeneration of the cartilage between T_1, and T_2.

32. (original): The method of claim 26, wherein an MRI technique first obtains a series of two-dimensional views of the joint, which are then mathematically integrated to give a three dimensional image.

33. (original): The method of claim 32, wherein the MRI technique employs a gradient echo, spin echo, fast-spin echo, driven equilibrium Fourier transform, or spoiled gradient echo technique.

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34. (newly presented): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about volume; and

selecting a therapy based on said information.

35. (newly presented): The method of claim 34, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

36. (newly presented): The method of claim 34, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

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converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

37. (newly presented): The method of claim 34, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

38. (newly presented): The method of claim 34, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

39. (newly presented): The method of claim 34, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

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determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

40. (newly presented): The method of claim 34, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

41. (newly presented): The method of claim 34, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

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42. (newly presented): The method of claim 34, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

43. (newly presented): The method of claim 34, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

44. (newly presented): The method of claim 34, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

45. (newly presented): The method of claim 34, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

46. (newly presented): The method of claim 34, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

47. (newly presented): The method of claim 46, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

48. (newly presented): The method of claim 47, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

49. (newly presented): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about area; and

selecting a therapy based on said information.

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50. (newly presented): The method of claim 49, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

51. (newly presented): The method of claim 49, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

52. (newly presented): The method of claim 49, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

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obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

53. (newly presented): The method of claim 49, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

54. (newly presented): The method of claim 49, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

55. (newly presented): The method of claim 49, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

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defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

56. (newly presented): The method of claim 49, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

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57. (newly presented): The method of claim 49, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

58. (newly presented): The method of claim 49, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

59. (newly presented): The method of claim 49, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

60. (newly presented): The method of claim 49, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

61. (newly presented): The method of claim 49, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

62. (newly presented): The method of claim 61, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

63. (newly presented): The method of claim 62, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

64. (newly presented): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about thickness; and

B1 selecting a therapy based on said information.

65. (newly presented): The method of claim 64, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

66. (newly presented): The method of claim 64, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

67. (newly presented): The method of claim 64, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

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subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

68. (newly presented): The method of claim 64, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

69. (newly presented): The method of claim 64, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

70. (newly presented): The method of claim 64, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

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defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

71. (newly presented): The method of claim 64, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

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72. (newly presented): The method of claim 64, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

73. (newly presented): The method of claim 64, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

74. (newly presented): The method of claim 64, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

75. (newly presented): The method of claim 64, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

76. (newly presented): The method of claim 64, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

77. (newly presented): The method of claim 76, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

78. (newly presented): The method of claim 77, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

79. (newly presented): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about curvature; and

selecting a therapy based on said information.

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80. (newly presented): The method of claim 79, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

81. (newly presented): The method of claim 79, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

82. (newly presented): The method of claim 79, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

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83. (newly presented): The method of claim 79, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

84. (newly presented): The method of claim 79, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

85. (newly presented): The method of claim 79, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

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defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

86. (newly presented): The method of claim 79, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

87. (newly presented): The method of claim 79, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

88. (newly presented): The method of claim 79, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

89. (newly presented): The method of claim 79, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

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90. (newly presented): The method of claim 79, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

91. (newly presented): The method of claim 79, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

92. (newly presented): The method of claim 91, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

93. (newly presented): The method of claim 92, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

94. (new): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about geometry; and

selecting a therapy based on said information.

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95. (newly presented): The method of claim 94, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

96. (newly presented): The method of claim 94, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

97. (newly presented): The method of claim 94, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

98. (newly presented): The method of claim 94, wherein said electronically evaluating further comprises:

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estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

99. (newly presented): The method of claim 94, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

100. (newly presented): The method of claim 94, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

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placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

101. (newly presented): The method of claim 94, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

102. (newly presented): The method of claim 94, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

103. (newly presented): The method of claim 94, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

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104. (newly presented): The method of claim 94, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

105. (newly presented): The method of claim 94, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

106. (newly presented): The method of claim 94, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

107. (newly presented): The method of claim 106, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

108. (newly presented): The method of claim 107, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

109. (new): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about water content; and

selecting a therapy based on said information.

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110. (newly presented): The method of claim 109, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

111. (newly presented): The method of claim 109, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

112. (newly presented): The method of claim 109, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

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113. (newly presented): The method of claim 109, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

114. (newly presented): The method of claim 109, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

115. (newly presented): The method of claim 109, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

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placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

116. (newly presented): The method of claim 109, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

117. (newly presented): The method of claim 109, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

118. (newly presented): The method of claim 109, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

119. (newly presented): The method of claim 109, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

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120. (newly presented): The method of claim 109, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

121. (newly presented): The method of claim 109, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

122. (newly presented): The method of claim 121, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

123. (newly presented): The method of claim 122, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

124. (new): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about sodium content; and

selecting a therapy based on said information.

125. (newly presented): The method of claim 124, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

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obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

126. (newly presented): The method of claim 124, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

127. (newly presented): The method of claim 124, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

128. (newly presented): The method of claim 124, wherein said electronically evaluating further comprises:

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estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

129. (newly presented): The method of claim 124, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

130. (newly presented): The method of claim 124, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

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131. (newly presented): The method of claim 124, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

132. (newly presented): The method of claim 124, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

133. (newly presented): The method of claim 124, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

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134. (newly presented): The method of claim 124, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

135. (newly presented): The method of claim 124, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

136. (newly presented): The method of claim 124, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

137. (newly presented): The method of claim 136, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

138. (newly presented): The method of claim 137, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

139. (new): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about hyaluronic acid content; and

selecting a therapy based on said information.

140. (newly presented): The method of claim 139, wherein said electronically evaluating further comprises:

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estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

141. (newly presented): The method of claim 139, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

142. (newly presented): The method of claim 139, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

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143. (newly presented): The method of claim 139, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

144. (newly presented): The method of claim 139, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

145. (newly presented): The method of claim 139, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

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defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

146. (newly presented): The method of claim 139, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

147. (newly presented): The method of claim 139, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

148. (newly presented): The method of claim 139, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

149. (newly presented): The method of claim 139, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

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150. (newly presented): The method of claim 139, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

151. (newly presented): The method of claim 139, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

152. (newly presented): The method of claim 139, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

153. (newly presented): The method of claim 152, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

154. (new): A method of treating a human joint disease involving cartilage comprising:

obtaining an electronic image of a joint, wherein said image includes both normal and diseased cartilage tissue;

electronically evaluating said image to obtain information about signal intensity or relaxation time of said normal or diseased tissue; and

selecting a therapy based on said information.

155. (newly presented): The method of claim 154, wherein said electronically evaluating further comprises:

estimating the loss of cartilage in a joint, wherein the joint comprises cartilage and accompanying bones on either side of the joint, which method comprises,

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obtaining a three-dimensional map of the cartilage at an initial time and calculating the thickness or regional volume of a region of degenerated cartilage mapped at the initial time,

obtaining a three-dimensional map of the cartilage at a later time,

calculating the thickness or regional volume of a region of degenerated cartilage mapped at the later time, and

determining the loss in thickness or regional volume of the region of degenerated cartilage between the later and initial times.

156. (newly presented): The method of claim 154, wherein said electronically evaluating further comprises:

assessing the condition of cartilage in a joint of a human, which method comprises,

electronically transferring an electronically generated image of a cartilage of the joint from a transferring device to a receiving device located distant from the transferring device,

receiving the transferred image at the distant location,

converting the transferred image to a degeneration pattern of the cartilage, and

transmitting the degeneration pattern to a site for analysis.

157. (newly presented): The method of claim 154, wherein said electronically evaluating further comprises:

determining the volume of cartilage loss in a region of a cartilage defect of a cartilage in a joint of a mammal which method comprises,

determining the thickness, D_N, of the normal cartilage near the cartilage defect,

obtaining the thickness of the cartilage defect, D_D, of the region,

subtracting D_D from D_N to give the thickness of the cartilage loss, D_L, and

B1 multiplying the D_L value times the area of the cartilage defect, A_D, to give the volume of cartilage loss.

158. (newly presented): The method of claim 154, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint of a mammal over time, which method comprises,

estimating the thickness or width or area or volume of a region of cartilage at an initial time T_1,

estimating the thickness or width or area or volume of the region of cartilage at a later time T_2, and

determining the change in the thickness or width or area or volume of the region of cartilage between the initial and the later times.

159. (newly presented): The method of claim 154, wherein said electronically evaluating further comprises:

providing a biochemically based map of joint cartilage of a mammal, wherein the joint comprises cartilage and associated bones on either side of the joint, which method comprises,

measuring a detectable biochemical component throughout the cartilage,

determining the relative amounts of the biochemical component throughout the cartilage,

mapping the amounts of the biochemical component in three dimensions through the cartilage, and

determining the areas of abnormally joint cartilage by identifying the areas having altered amounts of the biochemical component present.

160. (newly presented): The method of claim 154, wherein said electronically evaluating further comprises:

estimating the change of cartilage in a joint, wherein the joint comprises articular cartilage, which method comprises,

defining a 3D object coordinate system of the joint at an initial time, T_1,

identifying a region of a cartilage defect within the 3D object coordinate system,

defining a volume of interest around the region of the cartilage defect whereby the volume of interest is larger than the region of cartilage defect, but does not encompass the entire articular cartilage,

defining the 3D object coordinate system of the joint at a second timepoint, T_2,

placing the identically-sized volume of interest into the 3D object coordinate system at timepoint T_2 using the object coordinates of the volume of interest at timepoint T_1, and

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measuring any differences in cartilage volume within the volume of interest between timepoints T_1 and T_2.

161. (newly presented): The method of claim 154, wherein said electronically evaluating further comprises:

correlating cartilage image data, bone image data, and optoelectrical image data for the assessment of the condition of a joint, which method comprises,

(a) obtaining the cartilage image data of the joint with a set of skin reference markers placed externally near the joint,

(b) obtaining the bone image data of the joint with a set of skin reference markers positioned in the same manner as the markers in (a),

(c) obtaining the optoelectrical image data of the joint with a set of skin reference markers positioned in the same manner as (a) and (b), and

(d) using the skin reference markers to correlate the images obtained in (a), (b) and (c) with each other, wherein each skin reference marker is detectable in the cartilage and bone data and the opto-electrical data.

162. (newly presented): The method of claim 154, wherein said electronic image provides information on the thickness, shape, or curvature of said normal and said disease tissue or the location and size of said diseased tissue.

163. (newly presented): The method of claim 154, wherein said therapy comprises autologous chondrocyte transplantation, osteochondral allografting, osteochondral autografting, tibial corticotomy, femoral or tibial osteotomy.

164. (newly presented): The method of claim 154, wherein said therapy uses cartilage or bone tissue grown ex vivo, stem cells, an artificial non-human material, an agent that stimulates repair of said diseased tissue, or an agent that protects said diseased tissue and that protects adjacent normal tissue.

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165. (newly presented): The method of claim 154, wherein said information is used to determine the thickness or other geometrical feature of a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold, or a tissue regenerating material or tissue repair system.

166. (newly presented): The method of claim 154, wherein said image is obtained using ultrasound, computed tomography, positron emission tomography, a single photon emission computed tomography scan, or MRI.

167. (newly presented): The method of claim 166, wherein said information is used to generate a three-dimensional map of cartilage thickness or a physical model of said normal or said diseased tissue or both.

168. (newly presented): The method of claim 167, wherein said physical model is used to shape a tissue transplant, a tissue graft, a tissue implant, a tissue replacement material, a tissue scaffold or a tissue regenerating material or tissue repair system.

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